National Institute of Environmental Health Sciences

Trends in extreme apparent temperatures over the United States, 1949-2010

Author(s): Grundstein A, Dowd J
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Abstract:

Biometeorological indices, such as the apparent temperature, are widely used in studies of heat-related mortality to quantify the human sensation to the environmental conditions. Increases in the frequency of environmentally stressful days as indicated by biometeorological indices may augment the risk for heat-related morbidity and mortality. This study examines trends in the frequency of days with extreme maximum and minimum apparent temperatures across the United States for 1949-2010. An increase in occurrence of 1-day extreme minimum apparent temperatures is particularly notable, especially in the eastern and western United States, with 44% of stations exhibiting positive trends. About 20% of stations have positive trends in 1-day extreme maximum apparent temperature, mostly in the western United States. The median trend for both 1-day extreme maximum and minimum apparent temperature is approximately 2 days per 10 yr, indicating that by 2010 there were 12 more days with extreme apparent temperatures than there were in 1949. Few stations with trends in 4-day extreme minimum or maximum apparent temperatures were noted. An important finding is that there has been a 53% increase in stations with positive trends in 1-day extreme minimum apparent temperatures and a 63% increase in stations with positive trends in 1-day extreme maximum apparent temperatures since a similar study by Gaffen and Ross was conducted using the period 1949-95. Although there is a clear increase in the hazard for days with extreme apparent temperatures, changes in health outcomes are modulated by factors, such as the age of the population and access to air conditioning, that affect social vulnerability.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature, Other Exposure

Temperature: Extreme Heat, Fluctuations

Other Exposure: apparent temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified